Vincent Ng
Proposed Final Year Projects 2005-06

- VN001: Smartbots - Handyboard Robotic Controls
- VN002: Detecting Criminal Patterns for Building up a Better Community
  - Spatial and Temporal Crime Analysis
- VN003: MILES - mobile interactive learning education system
  - eLearning
- VN004: Workflow Management for Quality of Web Services
  - Web Services QoS
- VN005: Proximity Matching in BLIS
  - XML Approximation Querying
VN001: Smartbots - Handyboard
Robotic Controls

• Controller: MIT Handyboard
• Body parts: based on Lego Mindstorm robotics set
• Wireless video camera as vision module
  – Identify targets, obstacles, enemies, ...
  – Determine its own location based on vision.
• Other sensors: sonar (range), compass, light, touch, ...
• Robots can communicate with one another
• Robots can coordinate their behaviours
VN001: A Sample Robot Design
VN001: Sample Robot Actions
VN001: Robot Localization

determining its own location & direction based on what it (its camera) can see
VN001: Robot Collaboration

- Robots can communicate with one another
- Robots can coordinate their behaviours
VN002: Detecting Criminal Patterns for Building up a Better Community

- In collaboration with the Police Department of the HKSAR.
- Data modeling, database design and implementation, based on XML.
- Hot spot analysis
- Mining of association rules
- Other types of analysis
- Access through PC and PDA.
- Collaborative viewing and analysis.
- I can take more than 1 student.
- This is a team project with 2 supervisors (Stephen Chan & Vincent Ng).
- An industrial project with expected deliverables.
VN002: The Main UI
VN002: Hot Spot Analysis
VN002: Query/Data entry Interface
# VN002: Sample Rule Discovered

<table>
<thead>
<tr>
<th>Rule Num</th>
<th>Rules sorted according to Strength (==&gt; means Imply Presence Of)</th>
<th>% of Occurrence</th>
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<tbody>
<tr>
<td>1</td>
<td>MO=Burglary ==&gt; Weapon=Knife</td>
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<tr>
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<tr>
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<td>MO=Burglary ==&gt; Weapon=Weapon01</td>
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<tr>
<td>4</td>
<td>Weapon=Weapon01 ==&gt; MO=Burglary</td>
<td>40%</td>
</tr>
<tr>
<td>5</td>
<td>MO=Burglary ==&gt; Property Category=Mobile</td>
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<td>6</td>
<td>MO=Burglary ==&gt; Property Value=1000</td>
<td>20%</td>
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<td>7</td>
<td>MO=Robbery ==&gt; Weapon=Knife</td>
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<td>9</td>
<td>MO=Robbery ==&gt; Weapon=Weapon01</td>
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<td>13</td>
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<td>14</td>
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VN003: MILES – mobile interactive learning education system

• This project is to develop a mobile learning environment to teach database management.
• Three parts
  – The first part is to design and develop a mobile framework to support eLearning.
  – The second part is to develop learning objects according to the IEEE SCORM specifications and allow adaptive learning paths for different students.
  – The third part is to develop a project coordination tool and an adaptive assessment system to monitor the progress of students.
VN003

Step 1: Fill in the basic information of question

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<th>What Is Inheritance?</th>
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<tr>
<td>Content</td>
<td>In object-oriented technology, Visual Basic, C++ and JAVA are all ____ of th</td>
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<td>Image URI</td>
<td></td>
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<td>Question Type</td>
<td>True/False, Multiple-choice</td>
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<td>Category</td>
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<td>IRT Parameters</td>
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Assign a title to the question
VN004: Workflow Management for Quality of Web Services

- This project is to design and develop a methodology to provide an mutually agreed service level of web services through workflow management.
VN005: Proximity Matching in BLIS

- Building and querying a database of legislative documents based on XML.
- There may be some collaboration with the Department of Justice.
- The first aspect is to develop XML schemas for legislative documents related to the laws of Hong Kong.
  - Such may include the Basic Law, other existing laws, laws being drafted (such as related to article 23), relevant Chinese laws, international laws, etc.
- The next step is to develop an efficient framework to search a phrase within a XML document in which the phrase may fragment or appear approximately.
Phrase Proximity Matching Framework

- Divides into Preparation and Query Processing stages
- Create Node, Word indexes in the preparation stage
- Matching steps find matched instances of phrase keywords from Indexes
- Merge-join step associates instances to form resulting phrases
- Computes scores for resulting phrases
FYP proposals

- BAC VN001, vn002, vn003, vn005
- BACPT vn001, vn002, vn003, vn004, vn005
- BSciIT VN002
- IMT vn002
- DD vn004

- www.comp.polyu.edu.hk/~cstsyng